

METHODS AND APPARATUS FOR ELECTRICALLY AND/OR  
CHEMICALLY-MECHANICALLY REMOVING CONDUCTIVE MATERIAL  
FROM A MICROELECTRONIC SUBSTRATE

ABSTRACT

A method and apparatus for removing conductive material from a microelectronic substrate. In one embodiment, a support member supports a microelectronic substrate relative to a material removal medium, which can include first and second electrodes and a polishing pad. One or more electrolytes are disposed between the electrodes and the microelectronic substrate to electrically link the electrodes to the microelectronic substrate. The electrodes are then coupled to a source of varying current that electrically removes the conductive material from the substrate. The microelectronic substrate and/or the electrodes can be moved relative to each other to position the electrodes relative to a selected portion of the microelectronic substrate, and/or to polish the microelectronic substrate. The material removal medium can remove gas formed during the process from the microelectronic substrate and/or the electrodes. The medium can also have different first and second electrical characteristics to provide different levels of electrical coupling to different regions of the microelectronic substrate.